

WHAT IS CLAIMED IS:

1           1.    An antigen-based heteropolymer (AHP) complex comprising  
2   a monoclonal antibody specific for binding to complement receptor  
3   (CR1) site on a primate erythrocyte, wherein said monoclonal  
4   antibody is crosslinked to an antigen specific for a target  
5   pathogenic antibody or autoantibody.

1           2.    The AHP of Claim 1, wherein the monoclonal antibodies  
2   are selected from the group consisting of 1B4, HB8592, and 7G9.

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7           3.    The AHP of Claim 1, wherein the target antibody or  
  autoantibody is selected from the group consisting of antibodies  
  or autoantibodies to the following antigens: factor VIII, muscle  
  acetylcholine receptor, cardiolipin, platelet associated  
  proteins, antigens associated with Sjogren's Syndrome, double  
  stranded deoxyribonucleic acid (dsDNA), and single stranded DNA  
  (ssDNA).

1           4.    The AHP of Claim 1, wherein said antigen is selected  
2   from the group consisting of factor VIII, muscle acetylcholine  
3   receptor, cardiolipin, platelet associated proteins, antigens  
4   associated with Sjogren's Syndrome, double stranded  
5   deoxyribonucleic acid (dsDNA), and single stranded DNA (ssDNA).

1           5.    An AHP cocktail, comprising at least two AHP's wherein  
2   said AHP comprises a monoclonal antibody specific for binding to  
3   complement receptor (CR1) site on a primate erythrocyte, and

wherein said monoclonal antibody is crosslinked to an antigen specific for a target pathogenic antibody or autoantibody.

6. A method for treating an autoimmune disease comprising the steps of:

1) administering to a human or non-human primate a clinically effective amount of an AHP, said AHP comprising a monoclonal antibody specific for complement receptor (CR1) site on a primate erythrocyte, and wherein said monoclonal antibody is crosslinked to an antigen which is specific for a target pathogenic antibody or autoantibody;

2) allowing said AHP to bind to at least one competing CR1 site and to said pathogenic antibody or autoantibody; and

3) permitting said bound AHP to be cleared from circulation of said human or non-human primate.

7. The method of Claim 6, wherein the monoclonal antibody is selected from the group consisting of 1B4, HB8592, and 7G9.

8. The AHP of Claim 6, wherein the target antibody or autoantibody is selected from the group consisting of antibodies or autoantibodies to the following antigens: factor VIII, muscle acetylcholine receptor, cardiolipin, platelet associated proteins, antigens associated with Sjogren's Syndrome, double stranded deoxyribonucleic acid (dsDNA), and single stranded DNA (ssDNA).

1           9.    The AHP of Claim 6, wherein said antigen is selected  
2    from the group consisting of factor VIII, muscle acetylcholine  
3    receptor, cardiolipin, platelet associated proteins, antigens  
4    associated with Sjogren's Syndrome, double stranded  
5    deoxyribonucleic acid (dsDNA), and single stranded DNA (ssDNA).

1           10.   The method of Claim 6, wherein the AHP is administered  
2    intravenously to a human or non-human primate in a clinically  
3    effective amount.

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1           11.   The method of Claim 10, wherein said AHP is  
2    administered intravenously to a human in a clinically effective  
3    amount of 1-10 mg.

1           12.   The method of Claim 6, wherein said administration of  
2    said clinically effective amount of AHP is repeated until the  
3    pathogenic antibody or autoantibody is completely cleared from  
4    circulation of said human or non-human primate.

1           13.   The method of Claim 6, wherein said target pathogenic  
2    antibody or autoantibody is cleared from a circulatory system of  
3    a primate and said primate erythrocyte is recirculated through  
4    the circulatory system.

1           14.   A method for treating an autoimmune disease comprising  
2    the steps of:

3                1)    administering to a human or non-human primate an  
4    effective amount of an AHP cocktail comprising at least two

5 AHP's, wherein each AHP comprises a monoclonal antibody specific  
6 for complement receptor (CR1) site on a primate erythrocyte, and  
7 wherein said monoclonal antibody is crosslinked to an antigen  
8 which is specific for a target pathogenic antibody or  
9 autoantibody;

10 2) allowing said AHP cocktail to bind to at least one  
11 competing CR1 site and to said pathogenic antibody or  
12 autoantibody; and

13 3) permitting said bound AHP cocktail to be cleared  
14 from circulation of said human or non-human primate.

15 15. A method for treating an autoimmune disease comprising  
the steps of:

16 1) franking human or non-human primate erythrocytes  
17 with an AHP, said AHP comprising a monoclonal antibody specific  
18 for complement receptor (CR1) site on a primate erythrocyte, and  
19 wherein said monoclonal antibody is crosslinked to an antigen  
20 which is specific for a target pathogenic antibody or  
21 autoantibody;

22 2) administering to a human or non-human primate a  
23 clinically effective amount of the AHP-franked erythrocytes;

24 3) allowing said franked AHP to bind to said  
25 pathogenic antibody or autoantibody; and

26 4) permitting said bound AHP to be cleared from  
27 circulation of said human or non-human primate.